

**Hallauer, Lori**

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**From:** Wintergerst, Robert -FS [rwintergerst@fs.fed.us]  
**Sent:** Wednesday, May 22, 2013 9:14 AM  
**To:** Hoogerheide, Roger; Ihle, Beth -FS; Way, Steven  
**Subject:** RE: Revised AM  
**Attachments:** CARPENTER\_ACTION\_COVER.pdf; ACTION\_MEMO\_CARPENT.pdf

Folks:

I have just sent out two (2) original signed copies of the action memo for Carpenter Creek by UPS Next Day delivery to John at the address given below. In addition, I am enclosing a scanned copy of the document for everyone's records.

Sincerely,

Bob Wintergerst  
USDA-Forest Service,  
Northern Regional Office  
200 East Broadway  
P.O. Box 7669  
Missoula, MT 59807  
Phone # (406)329-3036  
FAX # (406) 329-3198  
Email [rwintergerst@fs.fed.us](mailto:rwintergerst@fs.fed.us)

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**From:** Hoogerheide, Roger [<mailto:Hoogerheide.Roger@epa.gov>]  
**Sent:** Monday, May 20, 2013 3:15 PM  
**To:** Wintergerst, Robert -FS; Ihle, Beth -FS; Way, Steven  
**Subject:** RE: Revised AM

Send the originals to:

John Goodrick  
USEPA REGION 8  
1595 Wynkoop St.  
***Mail Code:*** 8EPR-ER  
Denver, CO 80202-1129

John works in the same group as Steve and is handling the action memo from our side

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**From:** Wintergerst, Robert -FS [<mailto:rwintergerst@fs.fed.us>]  
**Sent:** Monday, May 20, 2013 3:07 PM  
**To:** Hoogerheide, Roger; Ihle, Beth -FS; Way, Steven  
**Subject:** RE: Revised AM

Roger:

Thank-you for the updates. I have taken two (2) copies of the Action Memo up to the Regional Forester for her signature. I am hoping that she will sign it today or early tomorrow. Once the two (2) copies are signed I will scan the document and FedEx the originals to EPA. Who at EPA do I send the originals to?

Sincerely,

Bob Wintergerst  
USDA-Forest Service,  
Northern Regional Office  
200 East Broadway  
P.O. Box 7669  
Missoula, MT 59807  
Phone # (406)329-3036  
FAX # (406) 329-3198  
Email [rwintergerst@fs.fed.us](mailto:rwintergerst@fs.fed.us)

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**From:** Hoogerheide, Roger [<mailto:Hoogerheide.Roger@epa.gov>]

**Sent:** Monday, May 20, 2013 1:26 PM

**To:** Wintergerst, Robert -FS

**Subject:** Revised AM

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United States  
Department of  
Agriculture

Forest  
Service

Region One

200 East Broadway  
P.O. Box 7669  
Missoula, MT 59807

File Code: 2160

Date: May 22, 2013

Route To:

Subject: Action Memo for Carpenter-Snow Creek Time Critical Removal

To: John Goodrick USEPA Region 8

John:

Enclosed are two (2) copies of the Action Memo for the Carpenter-Snow Creek Time Critical Removal Action. The Action Memo has been processed through the USDA-Forest Service chain of command and culminating with the approval by Regional Forester Faye L. Kruger.

We are asking that once the Action Memo has been processed through the EPA chain of command and signed by Director David A. Ostrander one of the original signed copies be returned to the Forest Service so that it can be permanently filed.

If you have any questions regarding this matter, please feel free to contact me at (406) 329-3036 or [rwintergerst@fs.fed.us](mailto:rwintergerst@fs.fed.us).

Sincerely,

BOB WINTERGERST  
Environmental Engineer  
USDA-Forest Service  
Northern Region





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

1595 Wynkoop Street  
DENVER, CO 80202-1129  
Phone 800-227-8917  
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United States  
Department of  
Agriculture

Forest  
Service

Lewis and Clark National Forest

1101 15<sup>th</sup> Ave  
Great Falls, MT 59XXX  
406-791-7700

REF: 8EPR-SR

ACTION MEMORANDUM

**SUBJECT:** Request for approval of a Time-Critical Removal Action and exemption from the 12 month statutory limits pursuant to the "Consistency Exemption" found at 40 CFR 300.415(b)(5)(i) for the Carpenter-Snow Creek NPL Site OU3-Carpenter Creek and Silver Dyke Tailings Impoundments

**FROM:** Roger Hoogerheide, Remedial Project Manager *RH 5/6/13*  
EPA Region 8, Montana Office

Steven Way, On-Scene Coordinator  
EPA Emergency Response Unit

Bethany A. Ihle, On-Scene Coordinator *Bethany Ihle 5/4/13*  
USDA Forest Service, Lewis and Clark National Forest

**THRU:** Joe Vranka, Superfund Branch Chief *Joe Vranka*  
EPA Region 8, Montana Office  
Laura Williams, Unit Leader  
EPA Region 8, Emergency Response Unit

Bill Avey, Supervisor *Bill Avey 5/13/13*  
USDA Forest Service, Lewis and Clark National Forest

Bob Wintergerst, Environmental Engineer *BW 5/20/2013*  
USDA Forest Service, Region One

Bob Kirkpatrick, Director of Engineering, CERCLA Coordinator *BK 5/20/2013*  
USDA Forest Service, Region One

**TO:** David A. Ostrander, Program Director  
EPA Region 8, Emergency Response and Preparedness

Faye L. Krueger, Regional Forester,  
USDA Forest Service, Region One

Date

## ROUTING AND TRANSMITTAL SLIP

TO: (Name, office symbol, room number,  
building, Agency/Post)

Initials

Date

1. Roger Hoogerheide (8MO)

RH

5/6/13

2. Joe Vranka (8MO)

J.V.

5/6/2013

3. Steve Way (EPR-ER)

4. Laura Williams (EPR-ER)

5. Laurianne Jackson (ECEJ - LEP)

6. Beth Ihle (USFS)

B.I.

5/6/2013

7. Bill Avey (USFS)

W.A.

5/13/2013

8. Bob Wintergerst (USFS)

B.W.

5/20/2013

9. Bob Kirkpatrick (USFS)

B.K.

5/20/2013

10.

<input type="checkbox"/> Action	<input type="checkbox"/> File	<input type="checkbox"/> Note and Return
<input type="checkbox"/> Approval	<input type="checkbox"/> For Clearance	<input type="checkbox"/> Per Conversation
<input type="checkbox"/> As Requested	<input type="checkbox"/> For Correction	<input type="checkbox"/> Prepare Reply
<input checked="" type="checkbox"/> Circulate	<input type="checkbox"/> For Your Information	<input type="checkbox"/> See Me
<input type="checkbox"/> Comment	<input type="checkbox"/> Investigate	<input type="checkbox"/> Signature
<input type="checkbox"/> Coordination	<input type="checkbox"/> Justify	

REMARKS

Concurrence

DO NOT use this form as a RECORD of approvals, concurrences, disposals,  
clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)

Room No. - Bldg.

Phone No.  
(406) 457-5031OPTIONAL FORM 41 (Rev. 1-94)  
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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

1595 Wynkoop Street  
DENVER, CO 80202-1129  
Phone 800-227-8917  
<http://www.epa.gov/region08>

REF: 8EPR-SR



United States  
Department of  
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Forest  
Service

Lewis and Clark National Forest

1101 15<sup>th</sup> Ave  
Great Falls, MT 59XXX  
406-791-7700

**ACTION MEMORANDUM**

**SUBJECT:** Request for approval of a Time-Critical Removal Action and exemption from the 12 month statutory limits pursuant to the "Consistency Exemption" found at 40 CFR 300.415(b)(5)(ii) for the Carpenter-Snow Creek NPL Site OU3-Carpenter Creek and Silver Dyke Tailings Impoundments

**FROM:** Roger Hoogerheide, Remedial Project Manager  
EPA Region 8, Montana Office

Steven Way, On-Scene Coordinator  
EPA Emergency Response Unit

Bethany A. Ihle, On-Scene Coordinator  
USDA Forest Service, Lewis and Clark National Forest

**THRU:** Joe Vranka, Superfund Branch Chief  
EPA Region 8, Montana Office

Laura Williams, Unit Leader  
EPA Region 8, Emergency Response Unit

Bill Avey, Supervisor  
USDA Forest Service, Lewis and Clark National Forest

Bob Wintergerst, Environmental Engineer  
USDA Forest Service, Region One

Bob Kirkpatrick, Director of Engineering, CERCLA Coordinator  
USDA Forest Service, Region One

**TO:** David A. Ostrander, Program Director  
EPA Region 8, Emergency Response and Preparedness

Faye L. Krueger, Regional Forester,  
USDA Forest Service, Region One

## **I. PURPOSE**

The purpose of this Action Memorandum is to request and document approval of the proposed removal and request exemption from the 12-month statutory limits for a removal action described herein for the Carpenter Creek and Silver Dyke tailings impoundments in Operable Unit 3 (OU3) of the Carpenter-Snow Creek National Priorities List Site (Site) near Neihart in Cascade County, Montana. The actions discussed herein are consistent with anticipated and/or potential future remedial actions at the Site. Due to the urgent nature of the action, it is expected to be completed in the 2013 construction season.

The administrative record for this Action Memorandum contains documentation of ongoing releases of hazardous substances from the Carpenter Creek and Silver Dyke tailings impoundments into Carpenter Creek and downstream into Belt Creek. These releases continue to cause exceedances of water quality standards for aquatic life and drinking water. They also impair use of the water as classified by the state of Montana. These releases deposit sediment within Carpenter, Belt and Sih-mem creeks and streamside tailings within the floodplains of Carpenter and Belt creeks and are detrimental to aquatic and aquatic dependant ecological communities. This removal action seeks to stabilize the tailings, reduce erosion and divert clean water flows away from the tailings until a permanent remedial action is taken. Conditions at the Site present an imminent and substantial endangerment to human health and the environment and meet the criteria for initiating a Time-Critical Removal Action under 40 C.F.R. Section 300.415(b)(2) of the National Contingency Plan (NCP).

This Time-Critical Removal Action involves no nationally significant or precedent setting issues. This removal action will not establish any precedent for how future response actions will be taken and will not commit the U.S. Environmental Protection Agency (EPA) and the United States Department of Agriculture Forest Service (USDA Forest Service) to a course of action that could have a significant impact on future responses or resources.

## **II. SITE CONDITIONS AND BACKGROUND**

Site Name:	Carpenter- Snow Creek NPL Site
Superfund Site ID (SSID):	089X
Operable Unit:	Operable Unit 3
NRC Case Number:	
CERCLIS Number:	MT0001096353
Site Location:	Cascade County, Montana
Lat/Long:	46.965509/-110.702772
Potentially Responsible Party (PRP):	
NPL Status:	Final 9/13/2001
Removal Start Date:	
Category of Removal:	Time-Critical Removal Action

## A. Site Description

The Site is within the Neihart Mining District, approximately 50 miles southeast of Great Falls, Montana. The nearest community is Neihart which is within the Site boundary and has about 80 yearlong residents. The Site, also known as the Montana Mining District, was a relatively steady producer of silver, lead and zinc from its discovery in 1881 to the 1940s.

The Site has been delineated into three OUs. OU1 includes the Neihart Community Soils Area, which encompasses the urban area of the town that contains contaminated soils associated with residential and public-use property. OU1 also includes the mine waste adjacent to residential property, waste accessible to the general public, and the Belt Creek tailings that were addressed as part of an EPA removal action in 2004.

The EPA has established preliminary study area boundaries for the purpose of planning and developing the initial scope of the Remedial Investigation/Feasibility Study for remaining OUs of the Site. OU2 contains the abandoned mine sites, mill sites and associated wastes within the Snow Creek watershed. The ore has low base metal content and higher gold content than other areas of the Site. OU2 also contains the abandoned mine sites and mill sites, within Lucy Creek, Mackay Creek, Haystack Creek and Burg Creek, in the upper Carpenter Creek basin and associated wastes at the base of the Neihart slope that lies adjacent to the town of Neihart (Figure 1). OU 3 contains portions of the upper Carpenter Creek basin as well as lower Carpenter Creek to the confluence with Belt Creek and any wastes in the Belt Creek floodplain extending to Monarch (Figure 1). As the Site is characterized further, these OU boundaries are subject to change. The proposed removal action is within OU3 of the Site.

The Silver Dyke Mining Complex also in OU3, is located in the Sih-mem Creek (formerly identified as Pioneer or Squaw Creek) drainage in the upper Carpenter Creek basin. The Silver Dyke Mining Complex includes the Silver Dyke adit, Glory Hole, mill, and tailings piles. The mine operated from 1921 until 1929 and was largely worked through surface stripping and underground extraction methods. The mine was opened by nearly 6,000 feet of drifts and raises that are still evident today in the Glory Hole, an open pit. Two adits provided underground access. The lower adit is the primary portal and is located at an elevation of 6,870 feet above sea level (amsl) and was approximately 1,000 feet in length (Young, 1927). The lower adit was approximately six feet wide and seven feet tall. A 36-inch gage track was installed in the adit and intersected four or more parallel drifts. Ore mined from the Glory Hole was delivered through chutes to the adit below and was then trammed to the mill (Young, 1927). During the summer months, ore from Glory Hole was removed as quickly as possible to prevent compaction or sticking due to the clayey content. During the winter months, when surface mining was impractical due to snow, mining was conducted underground.

The ore in the Silver Dyke Mining Complex is characterized by a wide body of low grade ore containing zinc and lead and a high proportion of copper. The low grade and



complexity of the ore complicated treatment and disposal, since the ore contained both oxidized and sulfide minerals and resulted in a large quantity of tailings and refuse. A tailings impoundment, now known as the Silver Dyke tailings, co-located in the drainage just east of the Silver Dyke Mill, was damaged by an earthquake in 1925 resulting in a flood of tailings into the valley below. In 1926, Silver Dyke Mining Company developed two new impoundments (upper and lower) for collection of mine tailings. These tailings, now known as the upper and lower Carpenter Creek tailings, or collectively as the Carpenter Creek tailings, were placed into the impoundments by slurry from the upstream Silver Dyke Mill.

## **1. Removal Site Evaluation**

The portion of OU3 that will undergo a Time-Critical Removal Action includes portions of the Silver Dyke and Carpenter Creek tailings impoundment features located upstream of the confluence of Snow Creek in the drainage of Carpenter Creek and its tributaries. The Silver Dyke tailings impoundment is located in an unnamed tributary to Carpenter Creek while the Carpenter Creek tailings are located in the main Carpenter Creek drainage.

The estimated volume of tailings for the Silver Dyke tailings impoundment is 56,350 cubic yards (cy) and disturbs approximately 4 acres. The estimated volume of waste in the Carpenter Creek tailings impoundments is about 250,000 cy with another estimated 200,000 cy of tailings in the floodplain between the Silver Dyke tailings impoundment and the Carpenter Creek tailings impoundments.

The Silver Dyke tailings impoundment surface samples contain copper results between 1,810 mg/kg and 4,130 mg/kg and lead results between 6,280 mg/kg and 8,120 mg/kg (TechLaw, 2012). Semi-annual surface water samples have also been taken from the unnamed tributary since 2009 where it crosses the road. Total metal results for lead range between 48.9 micrograms/liter (ug/L) and 189 ug/L while copper concentrations range between 11.9 and 82.7 ug/L (TechLaw, 2010, 2011, 2012).

On July 16, 2012, the EPA recorded a release from the Carpenter Creek tailings due to a thunderstorm. Photographs were taken throughout the drainage, and water samples were taken in Carpenter Creek at station CSC-104A, located above the confluence with Snow Creek and at CSC-103, near the confluence with Belt Creek. Sample results are presented in Table 1. A note to the file was prepared and submitted to the administrative record and contains the field notes and photographs taken (EPA, 2012).

The upper Carpenter Creek tailings impoundment surface samples contain copper concentrations ranging from 2,060 milligram/kilogram (mg/kg) to 4,260 mg/kg with an average of 2,762 mg/kg. The lead concentrations ranged from 4,580 mg/kg to 10,400 mg/kg with an average of 7,154 mg/kg. The zinc concentrations

ranged from 1,870 mg/kg to 3,690 mg/kg with an average of 2,604 mg/kg (Maxim, 2002).

The lower Carpenter Creek tailings impoundment surface samples show copper concentrations ranging from 114 mg/kg to 2,950 mg/kg with an average of 1,295 mg/kg. The lead concentrations ranged from 304 mg/kg to 8,763 mg/kg with an average of 4,135 mg/kg. The zinc concentrations ranged from 184 mg/kg to 2,242 mg/kg with an average of 891 mg/kg (Tetra Tech, 2012).

Samples collected in residential areas along Belt Creek and in Monarch, which is fourteen miles downstream, show elevated levels of these same heavy metals in soil and sediment. Routine run-off and high flows during spring snow melt continue to cause migration of the tailings, from the Carpenter Creek and Silver Dyke tailings impoundment, into the environment.

Table 1 below show the concentrations of hazardous substances found in surface water collected in Carpenter Creek below the lower Carpenter Creek tailings impoundment after a thunderstorm on July 16, 2012.

**Table 1**  
**Water Quality Results from July 16, 2012, Storm Event**

CSC103	Total Metals ug/L	Dissolved Metals ug/L
Arsenic	3.9	< 2.0
Cadmium	53.5	3.95
Copper	6290	13.1
Lead	10800	2.63
Zinc	7080	231

  

CSC104A	Total Metals ug/L	Dissolved Metals ug/L
Arsenic	4.83	< 2.0
Cadmium	36.2	18.4
Copper	5440	47
Lead	6450	22.7
Zinc	4950	2160

## **2. Physical Location**

The Site is located in west-central Montana in the Little Belt Mountains in T14N, R8E Sections 15, 16, and 21. The portion of the Site being addressed by this action is approximately 2 ½ miles northeast of the town of Neihart in the Carpenter Creek watershed. Site elevation is about 6,000 feet amsl.

### **3. Site Characteristics**

The Carpenter Creek tailings impoundment has minimal vegetative cover and is composed of clay to fine sand tailings. This tailings impoundment lies within the Carpenter Creek floodplain and is repeatedly releasing tailings into the creek during storm events and spring run-off. Overland flow and run-off from side gulches drains over the tailings impoundment and erodes the tailings into the stream.

Carpenter Creek surface water analytical results from samples taken since 2009 show that concentrations of heavy metals increase 2 to 5 times immediately below the Silver Dyke tailings impoundment from those samples collected immediately above this impoundment. The heavy metals increase to 10 to 20 times below the confluence with Sih-mem Creek. Additionally, both water and sediment metals concentrations in Belt Creek increase appreciably below the confluence with Carpenter Creek (TechLaw, 2010, 2011, 2012, 2013).

### **4. Release or Threatened Release of a Hazardous Substance, Pollutant or Contaminant into the Environment**

Sampling and analysis of groundwater, surface water, sediment and the tailings impoundments indicate the presence of high concentrations of heavy metals including lead, zinc, cadmium and copper. In addition, these same hazardous substances are found in surface waters and sediment for many miles downstream of the Site. The heavy metals are “hazardous substances” as defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (CERCLA), 42 U.S. C. Section 9601(14). The release of these hazardous substances into the environment poses an imminent and substantial threat to public health and the environment.

### **5. NPL Status**

The Site was listed on the National Priorities List (NPL) on September 13, 2001.

## **B. Other Actions to Date.**

### **1. Previous Actions**

There has been no previous CERCLA removal action performed in OU3 of the Site.

Initial investigations in OU3 were performed in 1993 by the state of Montana Abandoned Mine Reclamation Bureau. Samples were taken and initial waste volume and adit flow rates were estimated (Pioneer 1993). The USDA Forest Service performed an investigation of the upper Carpenter Creek tailings impoundment in 2002 and 2005 (Maxim 2002, 2005). The EPA has sampled

surface water and sediment throughout the Carpenter Creek drainage since 2009 (TechLaw 2010, 2011, 2012, 2013) and Tetra Tech, under a State contract, conducted investigations of the lower Carpenter Creek tailings in 2011 and 2012 (Tetra Tech, 2012, 2013). In addition, the EPA recorded a release from the Carpenter Creek tailings due to a thunderstorm on July 16, 2012. (EPA, 2012).

## **2. Current Actions**

Currently, investigations by the EPA Region 8 Superfund Remedial Program are ongoing and are expected to be presented in a Remedial Investigation Report in 2013. In addition to the remedial investigation activities that are ongoing at the Site, the USDA Forest Service has placed certified weed seed free straw bales along Carpenter Creek at the base of the Carpenter Creek tailings for temporary erosion control and has identified interim erosion control measures to be installed at the Carpenter Creek and Silver Dyke tailings impoundments.

## **C. Federal, State and Local Authorities' Roles**

### **1. Federal, State and Local Actions to Date**

The Site is a mixed ownership site with private property ownership and federally managed land under the USDA Forest Service. The EPA and USDA Forest Service are coordinating the implementation of this action and other response actions at the Site. The USDA Forest Service is performing specific portions of the Time-Critical Removal Action.

The state of Montana Department of Environmental Quality (DEQ), United States Fish and Wildlife Services (USFWS), Montana Fish Wildlife and Parks (FWP) and USDA Forest Service have directly assisted with Site investigations. DEQ, under an agreement with the EPA, performs contract development and oversight for remedial investigation activities for the OU2 and OU3 portions of the Site. DEQ, USFWS, EPA and the USDA Forest Service have participated in the assessment and planning associated with the removal proposed in this Action Memorandum.

### **2. Potential for Continued State/Local Response**

DEQ is anticipating involvement in future activities at the Site during subsequent removal and remedial actions. DEQ is expected to remain involved in the removal planning and oversight of this removal action and supports this removal action. The Cascade County Commission and City-County Health Department have regularly been briefed about activities at this Site and several members have participated in field trips to the Site to see impacted areas.

### III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The levels of surface contamination and the unconfined nature of the ongoing releases from the tailings impoundments support the decision to perform a Time-Critical Removal Action. Conditions existing at the Site meet the criteria for initiating a removal action under 40 CFR 300.415 (b) (2) of the National Contingency Plan (NCP).

The EPA has considered all the factors described in 40 CFR 300.415(b)(2) of the NCP and determined that the following factors apply at the Site.

- (i) *Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants;*

Human exposure occurs due to the uncontrolled nature of the tailings impoundments, and the potential for continued exposure exists. There is a potential for direct access where the tailings impoundments are located. Specifically, due to the Carpenter Creek and Silver Dyke tailings impoundments, sediment and downstream tailings are deposited within the floodplain, and/or consumption of water from Carpenter Creek may result in exposure. The tailings impoundments contain high levels of hazardous substances at the surface, and result in offsite migration of hazardous substances to surface water, channel bottom, floodplains and wetlands.

Aquatic life surveys conducted in Carpenter Creek below the confluence with Sih-mem Creek, indicate populations of benthic invertebrates are severely impaired and fish populations are absent. Investigations conducted by Montana Fish Wildlife and Parks and the EPA in 2010 and 2011 (FWP, 2011, 2012, and TechLaw, 2011, 2012) clearly indicate that metals contamination associated with ongoing contaminant releases severely inhibit aquatic life in Carpenter Creek and suggest that they are contributing to the impairment of aquatic life in Belt Creek below the confluence.

Surface water toxicity results from in-stream and laboratory testing indicate the Carpenter Creek water below Sih-mem Creek is acutely toxic to trout species. Additionally, in 2011, in-stream tests in Belt Creek below Carpenter Creek resulted in 60% mortality as compared to 16% at an upstream reference area (FWP 2012). Sediment toxicity tests conducted with *H. azteca* indicate that sediments from the main stem of Carpenter Creek below Sih-mem Creek and Belt Creek immediately downstream of Carpenter Creek are acutely toxic to benthic organisms (TechLaw, 2012).

- (ii) *Actual or potential contamination of drinking water supplies or sensitive ecosystems;*

All Montana waters are classified for multiple beneficial uses. Carpenter Creek is classified as a B-1 stream, which specifies that all of the following uses must be supported: drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. While Carpenter Creek is currently not used for any of its designated uses, the quality of the water must be maintained at a level that can support that

use to the extent possible based on a stream's natural potential. Carpenter Creek is listed as impaired for cadmium, copper, iron, lead, mercury, silver and zinc on the State of Montana's 303(d) list, named after Section 303(d) of the Clean Water Act. As such, total maximum daily loads have been developed for these metals (DEQ, 2011).

- (iv) *High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate;*

Hazardous substances including lead, copper and zinc are present at the surface of the tailings impoundments and in soil at concentrations that may pose a threat to human health and aquatic life. The tailings migrate from the impoundments. Investigation results show evidence of large volumes of tailings eroding from the Site during run-off events.

- (v) *Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;*

Annual snowmelt run-off conditions and thunderstorms contribute significantly to the continuing release of the hazardous substances from the un-vegetated and unstable tailings impoundments and into adjacent surface water, which results in the release of total suspended solids containing heavy metal concentrations. Erosion of the tailings impoundments has led to heavy sediments and streamside tailings contamination downstream. In addition, acute exposures to aquatic species can occur during releases that occur, such as during thunderstorms and spring run-off, leading to reductions in the number and diversity of the aquatic and aquatic dependent community, and these events contribute to deposition of tailings near downstream residences.

- (vii) *The availability of other appropriate federal or state response mechanisms to respond to the release;*

While the EPA is the lead agency for the remedial actions at the Site, the USDA Forest Service is the lead for this removal action. Additional measures in the proposed action may be implemented by the USDA Forest Service or EPA pending available funding. The USDA Forest Service, EPA and DEQ will participate in the oversight of the work on the removal action.

#### **A. Threats to the Public Health or Welfare**

The threats to public health or welfare is the risk associated with human contact with contaminated surface water and unconfined tailings by yearlong downstream residents, nearby summer residents and dispersed public recreationists doing activities such as rock hounding or gold panning, fishing and/or riding an ATV or motorcycle. Exposure could be through water, soil contact, or dust inhalation. ATV and dirt bike riding are considered to be the most exposure intense recreational uses because of the dust generated by the vehicles and the potential for people to inhale that dust off of the tailings impoundments. While the frequency of exposure is generally expected to be low because these areas are located on property that is not designated for this use, administrative controls such as fencing and signage are proposed as part of this removal action to eliminate this exposure

pathway.

## **B. Threats to the Environment**

Lead, zinc, cadmium and copper from the tailings impoundments are the primary threats to aquatic life and terrestrial biota (as well as human health). The pathways by which aquatic and aquatic dependent ecological receptors could become exposed to contaminants at the Site are direct contact with the tailings in their present location or at depositional areas downstream following erosion and direct contact with dissolved metals that have leached into water from the tailings impoundments. Terrestrial receptors may be exposed to tailings through incidental soil or sediment ingestion and consumption of contaminated food items.

The threats to the environment, especially to the aquatic and aquatic dependent life of Carpenter Creek and the Belt Creek drainage, have been described previously in this Action Memorandum. The following are descriptions of the threats to the environment posed by the specific contaminants found in the tailings impoundments at the Site.

### **Zinc**

Zinc is found in Carpenter Creek between the Silver Dyke tailings impoundment and the lower Carpenter Creek tailings impoundments at levels up to 30 times the surface water quality standard. Zinc produces acute toxicity in freshwater organisms over a range of concentrations below those found on the Site. Acute toxicity is similar for freshwater fish and invertebrates. In many types of aquatic plants and animals, growth, survival and reproduction can all be adversely affected by elevated zinc levels.

### **Cadmium**

Cadmium levels in Carpenter Creek between the Silver Dyke tailings impoundment and the lower Carpenter Creek tailings impoundment are approximately 10 times above acute surface water quality standards (based on water hardness). Laboratory experiments suggest that cadmium may have adverse effects on reproduction in fish at levels present in lightly to moderately polluted waters. Cadmium is highly toxic to wildlife; it is cancer-causing and teratogenic and potentially mutation-causing, with severe sublethal and lethal effects at low environmental concentrations. It bio-accumulates at all trophic levels, in the livers and kidneys of fish. Crustaceans appear to be more sensitive to cadmium than fish and mollusks. Cadmium can be toxic to plants at lower soil concentrations than other heavy metals and is more readily taken up than other metals.

### **Copper**

Copper concentrations in Carpenter Creek between the Silver Dyke tailings impoundment and the lower Carpenter Creek tailings impoundment are found at levels approximately ten times above acute (based on water hardness) surface water quality standards. Copper produces acute toxicity in freshwater animals and data is available for species in 41

Genera. Data for eight species indicate that acute toxicity also decreases with increases in alkalinity and total organic carbon. Chronic values are available for 15 freshwater species and for Brook Trout it may be as low as 3.873 ug/l, depending on hardness. During the low flow sampling event, copper concentrations are usually above 100 ug/L between the impoundments (TechLaw, 2010, 2011, 2012, 2013). Fish and invertebrate species seem to be about equally sensitive to the chronic toxicity of copper. Copper is highly toxic in aquatic environments and has effects in fish, invertebrates and amphibians. Caged fish bioassays below the lower Carpenter Creek tailings impoundment conducted by FWP in 2011 using Westslope Cutthroat Trout fingerlings saw 100% mortality in less than 24 hours (FWP, 2012). Copper will bio-concentrate in many different organs in fish (potential low, however) and mollusks. Copper sulfates and other copper compounds are algacides, with sensitive algae potentially affected by free copper at low ppb concentrations. Toxicity tests have been conducted on copper with a wide range of freshwater plants, and their sensitivities are similar to those of animals. Copper concentrations (and possibly arsenic, cadmium and other metals) in the aquatic environment (surface water, diet) also impose low-level chronic stress on aquatic macro invertebrates, trout and other fish. The most likely manifestation of this stress is decreased growth.

#### **IV. ENDANGERMENT DETERMINATION**

Actual or threatened releases of hazardous substances from the Carpenter Creek and Silver Dyke tailings impoundments, if not addressed by implementing the response actions described in this Action Memorandum, present an imminent and substantial threat to public health, welfare or the environment.

#### **V. EXEMPTION FROM STATUTORY LIMITS**

A statutory exemption is requested based on the Consistency Exemption for an NPL site. This removal will be consistent with potential remedial actions currently anticipated for the Site. The proposed removal meets the criteria for consistency, i.e. does not foreclose the remedial action and appropriateness, for example it is necessary to avoid a foreseeable threat and to prevent the migration of contaminants. Construction to reduce erosion and limit run-on and run-off through the tailings impoundments until a permanent remedial action is taken will not interfere with likely long term remedial alternatives to address surface water and soil contamination. The amount of construction discussed herein is estimated to take one construction season to complete. However, due to the short construction season in the high elevation and the difficulty of the working conditions, an exemption is requested.



## **VI. PROPOSED ACTION AND ESTIMATED COSTS**

### **A. Proposed Actions**

#### **1. Proposed Action Description**

The removal action specified in this Action Memorandum includes response actions at the Silver Dyke tailings and upper and lower Carpenter Creek tailings impoundments to stabilize these tailings until a permanent remedial action is taken. The USDA Forest Service has developed engineering design drawings and specifications for these erosion control measures to be constructed during the 2013 construction season.

Stabilization activities at various locations with the Carpenter Creek and Silver Dyke tailings impoundments include, but are not be limited to: 1) Construction of lined surface run-on and run-off ditches on the lower and upper Carpenter Creek tailings to reduce storm flows and snowmelt from eroding tailings, 2) Installation of diversion channels to route clean water around all three tailings impoundments; 3) Installation of erosion check dams at all three tailings features in areas where deep rills have formed in past erosion events, 4) Installation and maintenance of a continuous certified weed- free straw bale erosion berm (or a similar erosion control measure) along the Carpenter Creek tailings 5) Consolidate tailings on location at the Silver Dyke tailings impoundment; 6) Repair of the road-drainage crossing area of the Silver Dyke tailings to prevent head-cutting, and sedimentation of the tailings and reconstructing appropriate drainage features and armoring to provide for travel on the Pioneer Lane road; and 7) Administrative controls such as fencing and signage on the Silver Dyke and Carpenter Creek tailings impoundments to eliminate trespass with recreational vehicles and to educate the public on the potential dangers.

#### **2. Contribution to Remedial Performance**

The Time-Critical Removal Action is consistent with the overall objectives for the Site to mitigate the risks to human health and the environment due to direct contact with tailings containing lead, zinc, cadmium and copper, and from releases of these hazardous substances to the surface water. No remedial action has been selected for the Site.

#### **3. Engineering Evaluation/Cost Analysis (EE/CA)**

An EE/CA is not required for a Time-Critical Removal Action.

#### **4. Applicable or Relevant and Appropriate Requirements (ARARs)**

This removal action will attain to the extent practicable, considering the exigencies of the situation, applicable or relevant and appropriate requirements of

federal environmental or more stringent state environmental laws. The proposed action is limited in scope to activities as reducing erosion and limiting run-on and run-off through the tailings impoundments. The ARARs identified for this removal action include, but are not limited to the following:

#### FEDERAL ARARS

- a. Clean Water Act (33 USC §§ 1341 and 1344, 40 CFR Part 230) is relevant and appropriate.
- b. National Historic Preservation Act (16 USC § 470, 16 USC § 461 (General Provisions), 36 CFR 60, 36 CFR 63, 36 CFR 800, 40 CFR Part 6.310(a)) is applicable.
- c. Floodplain Management Regulations (40 CFR Part 6.302(b)) are applicable.

#### STATE ARARS

- a. Stormwater Runoff Control Requirements (ARM 17.24.633 and ARM 17.30.1341) are applicable.
- b. Montana Ambient Air Quality Regulation (ARM 17.24.761) is applicable.
- c. Montana Floodplain and Floodway Management Act and Regulations (MCA 76-5-404, ARM 36.15.601) is applicable.
- d. Montana Mine Reclamation Regulations (ARM 17.24.505, .631, .635 – .638, .640, .703, .714 and .721) are relevant and appropriate.
- e. Noxious Weeds (MCA 7-22-2101(8)(a) and ARM 4.5.201) are applicable.

### 5. Project Schedule

The planned start is August 2013 and planned completion in September 2014.

### B. Estimated Costs\*

It is estimated that the portion of the removal action that will be implemented by the Forest Service will cost \$400,000, which is funded by the ASARCO Environmental Trust. Additional measures in the proposed action may be implemented by the USDA Forest Service or the EPA pending available removal program funding.

Clean-up Contractor costs	\$625,000
Other Extramural Costs (Engineering or other Federal Agencies)	\$25,000
Contingency Costs (20 percent of subtotal)	\$100,000
Total Removal Project Ceiling	\$750,000

\*EPA direct and indirect costs, although cost recoverable, do not count toward the removal ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA. "

**VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

Heavy metal contaminants will continue to migrate off-Site from the Carpenter Creek and Silver Dyke tailings impoundments during the frequent, high intensity thunderstorms that occur in this area in the summer as documented in July 2012, and during annual spring run-off. The erosion of the tailings impoundments will continue to add to the degraded water quality of Carpenter Creek and its downstream tributary Belt Creek, which has year-long residents living adjacent to the stream. The tailings impoundments, as they exist now, would continue to substantially impact and degrade the creek ecosystems. Additional contaminants will be carried downstream into Belt Creek thereby impacting additional ecosystems and potentially residential property, should action be delayed or not taken.

**VIII. OUTSTANDING POLICY ISSUES**

None

**IX. ENFORCEMENT**

A separate Enforcement Addendum provides a confidential summary of current and potential future enforcement actions.

**X. RECOMMENDATION**

This decision document represents the selected Time-Critical Removal Action for the Carpenter Creek and Silver Dyke tailings impoundments, located in OU3 of the Site. This Action Memorandum is developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal action and the CERCLA section 104(c) consistency exemption from the 12-month requirement and we recommend your approval of this proposed Time-Critical Removal Action. The total project ceiling, if approved, will be \$600,000; of this amount \$200,000 may be funded from the EPA Regional removal allowance, and \$400,000 will be funded in 2013 from the ASARCO Environmental Trust to the USDA Forest Service.

APPROVE

\_\_\_\_\_  
David A. Ostrander, Director  
EPA Region 8, Emergency Response and Preparedness Program

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Faye L. Krueger, Regional Forester  
USDA Forest Service, Region One

  
\_\_\_\_\_  
Date

DISAPPROVE

\_\_\_\_\_  
David A. Ostrander, Director  
EPA Region 8, Emergency Response and Preparedness Program

\_\_\_\_\_  
Date

\_\_\_\_\_  
Faye L. Krueger, Regional Forester  
USDA Forest Service, Region One

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Date